

Claims

1. A computer-readable medium storing a computer program for use in conjunction with a web browser client program to rate a web page relative to a
5 selected characteristic, the program comprising:

first means for identifying natural language textual portions of the web page and forming a list of words that appear in the identified natural language textual portions of the web page;

10 a database of predetermined words that are associated with the selected characteristic;

second means for querying the database to determine which of the list of words has a match in the database;

15 third means for acquiring a corresponding weight from the database for each such word having a match in the database so as to form a weighted set of terms; and

fourth means for calculating a rating for the web page responsive to the weighted set of terms, the calculating means including means for determining and taking into account a total number of natural language words that appear in the identified natural language textual portions of the web page.

20 2. A computer-readable medium storing a computer program for use in conjunction with a web browser client program to rate a web page according to claim 1 wherein the selected characteristic is pornographic content; and

the database includes a predetermined list of words and phrases that are associated with web pages having pornographic content.

25 3. A computer-readable medium storing a computer program for use in conjunction with a web browser client program to rate a web page according to claim 1 wherein the calculating means includes means for summing the weights for each word having a match in the database.

30 4. A computer-readable medium storing a computer program for use in conjunction with a web browser client program to rate a web page according to

claim 1 and further comprising means for storing a predetermined threshold rating, and means for comparing the calculated rating to the threshold rating to determine whether the web page likely has the selected characteristic.

5 5. A method of analyzing content of a digital data set, the method comprising the steps of:
 identifying natural language textual portions of the data set;
 forming a word list including all natural language words that appear in the textual portions of the data set;
 for each word in the word list, querying a preexisting database of selected
10 words to determine whether or not a match exists in the database;
 for each word having a match in the database, reading a corresponding weight from the database so as to form a weighted set of terms; and
 calculating a rating for the data set responsive to the weighted set of terms.

15 6. A method according to claim 5 wherein the data set comprises a web page.

 7. A method according to claim 5 wherein the data set comprises a web page and further comprising:
 identifying meta-content in the web page; and
 including words from the meta-content of the web page in the word list so
20 that the meta-content is taken into account in calculating the rating for the web page.

 8. A method according to claim 5 wherein said calculating step includes:
 summing the weighted set of terms together to form a sum;
 multiplying the sum by a predetermined modifier to scale the sum;
25 determining a total number of words on the web page; and
 dividing the scaled sum by the total number of words on the data set to form the rating.

 9. A method according to claim 5 wherein the data set comprises an email.

30 10. A method of building a target attribute set for use in analyzing content of a digital data set, the method comprising the steps of:

acquiring a plurality of sample data sets for use as training data sets;
designating each of the training data sets as "yes" or "no" with respect to a
predetermined content characteristic;

5 parsing through the content of all of the training data sets to form a list of
regular expressions that appear in the training data sets;

forming data reflecting a frequency of occurrence of each regular expression
in the training data sets;

analyzing the frequency of occurrence data, in view of the "yes" or "no"
designation of each data set, to identify and select a set of regular expressions that
10 are indicative of either a "yes" designation or a "no" designation of a data set with
respect to the predetermined characteristic; and

storing the selected set of regular expressions to form a target attribute set
based on the downloaded training pages, whereby the target attribute set provides a
set of regular expressions that are useful in discriminating data set content relative
15 to the predetermined content characteristic.

11. A method of building a target attribute set according to claim 10
wherein the digital data set comprises a web page; the sample data sets comprise a
plurality of web pages downloaded from the world-wide web; and the predetermined
content characteristic is pornographic content.

20 12. A method of building a target attribute set according to claim 11 further
comprising selecting a number of web pages on the order of 1,000 web pages for
use as training data sets.

13. A method of building a target attribute set according to claim 10
wherein the digital data set comprises an email message; the sample data sets
25 comprise a plurality of email messages; and the predetermined content characteristic
is pornographic content.

14. A method of assigning weights to a list of regular expressions for use in
analyzing content of a digital data set, the method comprising:

providing a predetermined target attribute set associated with a
30 predetermined group of training data sets, the target attribute set including a list of

regular expressions that are deemed useful for discriminating data set content relative to a predetermined content characteristic;

assigning an initial weight to each of the regular expressions in the target attribute set, thereby forming a weight database;

5 designating each of the group of training data sets as either "yes" or "no" relative to whether it exhibits the predetermined content characteristic;

examining one of the group of training data sets to identify all regular expressions within the data set that also appear in the target attribute set, thereby forming a match list for said data set;

10 in a neural network system, rating the examined data set using the weightings in the weight database;

comparing the rating of the examined data set to the corresponding "yes" or "no" designation to form a first error term;

repeating said examining, rating and comparing steps for each of the remaining data sets in the group of training data sets to form additional error terms;
15 and

adjusting the weights in the weight database in response to the first and the additional error terms.

15. A method of assigning weights according to claim 14 wherein the predetermined content characteristic is pornography.
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16. A method for controlling access to potentially offensive or harmful web pages comprising the steps of:

in conjunction with a web browser client program executing on a digital computer, examining a downloaded web page before the web page is displayed to the user; said examining step including analyzing the web page natural language
25 content relative to a predetermined database of words to form a rating, the database including words previously associated with potentially offensive or harmful web pages, and the database further including a relative weighting associated with each word in the database for use in forming the rating;

comparing the rating of the downloaded web page to a predetermined threshold rating; and

if the rating indicates that the downloaded web page is more likely to be offensive or harmful than a web page having the threshold rating, blocking the downloaded web page from being displayed to the user.

17. A method according to claim 16 further comprising:

if the downloaded web page is blocked, displaying an alternative web page to the user.

18. A method according to claim 17 wherein said displaying an alternative web page includes generating or selecting the alternative web page responsive to a predetermined categorization of the user.

19. A method according to claim 17 wherein the alternative web page includes an indication of the reason that the downloaded web page was blocked.

20. A method according to claim 16 wherein the alternative web page includes one or more links to other web pages selected as age-appropriate in view of a predetermined categorization of the user.

21. A computer-readable medium storing a web search engine server program, the program comprising:

a data acquisition component for acquiring meta-content from target web sites into an internal database; and

an inquiry component for selecting and presenting meta-content from the internal database in response to an end-user request;

the data acquisition component including an analysis component that analyzes the content of web pages corresponding to the meta-content stored in the internal database, and returns a rating for each such web page; and

means for adding said returned ratings into the internal database as additional meta-content in association with the corresponding web pages.

22. A computer-readable medium storing a web search engine server program according to claim 21, the analysis component including:

first means for identifying natural language textual portions of the web page and forming a list of words that appear in the identified natural language textual portions of the web page,

5 a second internal database of predetermined words that are associated with the selected characteristic;

second means for querying the second internal database to determine which of the list of words has a match in the database;

10 third means for acquiring a corresponding weight from the second internal database for each such word having a match in the second internal database so as to form a weighted set of terms; and

fourth means for calculating a rating for the web page responsive to the weighted set of terms, the calculating means including means for determining and taking into account a total number of natural language words that appear in the identified natural language textual portions of the web page.

15 23. A computer-readable medium storing a web search engine server program according to claim 21, and further comprising means for including the additional meta-content in said presenting meta-content from the internal database in response to an end-user request.

20 24. A computer-readable medium storing a web search engine server program according to claim 21, and further comprising means for modifying the meta-content results presented in response to an end-user request based upon the said ratings.

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